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NASA Procedural Requirements

COMPLIANCE IS MANDATORY**NPR 8705.6A**

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Request Notification of Change

 (NASA Only)**Subject: Safety and Mission Assurance Audits, Reviews, and Assessments****Responsible Office: Office of Safety and Mission Assurance**[| TOC](#) | [Preface](#) | [Chapter1](#) | [Chapter2](#) | [Chapter3](#) | [Chapter4](#) | [AppendixA](#) | [AppendixB](#) | [ALL](#) |

Chapter 1. Safety and Mission Assurance Audits, Reviews, and Assessments Introduction

1.1 Introduction

1.1.1 Per NPD 1000.3, The NASA Organization, the Chief Safety and Mission Assurance Officer is responsible for providing leadership, policy direction, functional oversight, assessment, and coordination for the following:

- a. Strategies, policies, procedures and guidelines, and standards for safety and mission assurance (hereinafter referred to as SMA requirements).
- b. Implementation of SMA requirements in NASA programs/projects and institutions.
- c. Application of safety, reliability, maintainability, and quality disciplines and tools, knowledge, techniques, and practices throughout the program/project life cycle, including risk assessment and risk management.

Verification of the effectiveness of SMA programs and processes.

1.1.2 NPD 1000.3, The NASA Organization, also specifies SMA-related responsibilities for other key Agency management. Specifically, Center Directors are chartered and accountable to protect the safety and health of the public, NASA team members, and those national assets entrusted to NASA by fully integrating safety, reliability, quality, and statutory and regulatory compliance within and across the Center's plans, facilities, operations, functions, and products. Further, the Center SMA Directors are responsible and accountable for implementing and assuring compliance with Agency, Center, and program SMA requirements.

1.1.3 NPD 8700.1, NASA Policy for Safety and Mission Success, instructs OSMA to establish formal review processes to certify the safety and operational readiness of flight hardware/software, mission-critical support equipment, hazardous facilities/operations, and high-energy ground-based systems. OSMA has implemented the Review and Assessment Division (and Center-based counterparts) to accomplish this process.

1.1.4 This document outlines processes for reviews and assessments to verify compliance with NASA SMA process and technical requirements as required by NPD 8700.1, NASA Policy for Safety and Mission Success. A subset of these requirements, uniquely applicable to a given NASA program/project, facility, or operation, is established as a baseline requirements set (BRS).

1.2 Objective

1.2.1 The objectives of this NPR are to:

- a. Determine the institution's compliance with Federal, State, and local OSHA requirements and Agency SMA process and technical requirements.
- b. Determine the program/project's compliance with SMA process and technical requirements.
- c. Determine the Agency's readiness to test, operate, fly, or launch.

1.2.2 The principal chapters of this NPR provide requirements for supporting the three key processes (summarized in the following subparagraphs) to achieve the objectives of this NPR.

- a. The Institutional/Facility/Operational (IFO) SMA Audit process provides independent verification that institutions, facilities, and operations are in compliance with the applicable IFO BRS containing applicable NASA SMA process and technical requirements.
- b. The Programmatic Audit and Review (PA&R) process provides independent compliance verification of applicable NASA SMA process, technical, and engineering performance specification requirements within the applicable programmatic BRS.
- c. The Safety and Mission Assurance Readiness Review (SMARR) is conducted to prepare SMA management to participate in program/project management pre-operations or major milestone review forums. The SMARR provides the knowledge, visibility, and understanding necessary for SMA managers to concur or nonconcur in program decisions to proceed.

1.3 The Basics. The following paragraphs provide general definitions, descriptions, and examples critical to understanding this NPR.

1.3.1 Compliance Verification. Compliance verification is defined as those activities required to: 1) verify Agency-level SMA process and technical requirements are appropriately documented and flowed down, 2) verify that documented SMA processes are in place and capable, and 3) verify implementation and compliance with process and technical requirements (e.g., through onsite in-process audits and reviews for verification of work discipline). The objectives are accomplished by collecting and examining objective quality evidence (OQE) to verify that the appropriate requirements are established and are being implemented.

1.3.2 SMA Process Requirements.

1.3.2.1 SMA process requirements are defined as those requirements necessary to ensure that safety engineering, reliability engineering, maintainability engineering, and quality engineering and assurance processes are in place for Agency programs, projects, facilities, and operations. These process requirements are structured to ensure that 1) public safety risks are at or below accepted norms and 2) mission success and safety risks for NASA activities are within acceptable bounds.

Note: Examples include requirements that address system safety, range safety, worker safety, human rating, reliability, maintainability, quality assurance, pre-operational review forums, surveillance, audit, inspection, and review panels.

1.3.2.2 SMA process requirements are found in all of the following areas: procurement, software design/engineering, software design verification, hardware design/engineering, hardware design verification, manufacturing, manufacturing verification, integrated test and evaluation, assembly, scheduled hardware transportation activities, ground and on-orbit operations, end-of-life disposition, human factors, sustaining engineering, communications, and maintenance. The NASA SMA community has the primary responsibility to establish and to verify compliance with SMA process requirements.

1.3.3 SMA Technical Requirements. For the purpose of this document, technical requirements are defined as engineering requirements established for assuring the conduct of safe and successful activities and missions. These requirements include both "how to do it" requirements (e.g., soldering standard, welding standards, coatings, packaging) as well as "how to check it" requirements (e.g., manufacturing process control, mechanical and electrical testing standards, nondestructive evaluation). The NASA SMA community has the responsibility to verify compliance with technical requirements affecting safe and reliable operations.

1.3.4 Engineering Performance Specification (EPS) Requirements.

1.3.4.1 EPS requirements are quantitative engineering specifications related to a specific aerospace system design, test, manufacturing, assembly integration, communications, or ground and on-orbit operational activity. Typically, EPS requirements evolve from top-level mission objective requirements, process and technical requirements, and appropriate technical standards, military standards, and military specifications.

Note: Examples include tank wall thickness, a voltage range, a current value, a heating rate, or an erosion rate.

1.3.4.2 NASA program managers supported by Center-based matrixed discipline engineering personnel, systems engineering personnel, and SMA personnel typically conduct compliance verification for EPS requirements, including safety-critical items. While the NASA SMA community in general does not directly verify compliance for EPS requirements, the SMA community does verify compliance with the safety, reliability, maintainability, and quality assurance technical and process requirements that govern the establishment of EPS requirements.

1.3.5 BRS. The BRS represents a set of requirements jointly negotiated among the program/project, engineering community, SMA community, and, as appropriate, institutional organizations. Typically, the BRS represents a subset of Agency SMA process, technical, and engineering performance specification requirements uniquely applicable to a

given NASA program, project, facility, or operation. For existing programs/projects, the existing requirements will be "grandfathered" as the BRS.

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